The labour market impacts of female internal migration: Evidence from a natural experiment in South Africa

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January 31, 2019

This paper studies the changing nature and labour market impacts of female internal migration in the post-Apartheid period in South Africa. To identify the causal effects of migration on labour market outcomes, I take advantage of the existence of strict migration controls during Apartheid as well as the rapid structural transformation of the economy that occurred in the post-Apartheid period. This unique setting allows me to construct a plausibly exogenous shift-share instrument for female migrant concentration based on male migration flows from homelands (reserves) during Apartheid. I combine large sample migration data from censuses with detailed labour market outcome data from labour force surveys. I first document a sudden increase in female migration after the end of migration restrictions as well as a dramatic rise in the education levels of the migrating population. Exploiting substantial variation in female migrant flows into 220 districts, I find that these inflows have an overall large positive effect on hourly income for non-migrant men and women, with stronger effects for women. I also find that female migration increases employment for highly educated women relative to other female education groups and reduces employment for low-educated men. I briefly discuss possible channels for these effects, including substitution/complementarities in production and the role of domestic labour. I will extend this section in later versions of this paper.

Keywords: internal migration, economics of gender, natural experiment
JEL Classification: R23, J16, J22

*Email: m.j.sharp@lse.ac.uk. I thank J. Vernon Henderson, Henry Overman, Olmo Silva, Stephen Gibbons, Eric Rougier and Andreas Diemer for helpful comments and suggestions on this early draft, as well as participants at the 2018 LSE SERC Conference and the 2018 International Development Economics GDRI Conference. All errors are my own.
1 Introduction

Most studies in the economics literature on international and internal migration, and their impacts, focus on male migrants and effects on male natives/non-migrants (Dustman et al. 2016). However, a gendered focus on migration is important (Pfeiffer et al. 2007). Women may migrate for different reasons to men and the effects of migrant networks may be gender-specific (Enchautegui 1997, Davis & Winters 2001). Since women’s participation in the labour market may be quite distinct from that of men, their arrival in receiving regions would be expected to have different effects on the non-migrant population (Cortes & Tessada 2011). For the same reason, female non-migrants are likely to be affected by in-migration differently to men. This paper focuses on measuring the labour market impacts of female internal migration in South Africa, examining the heterogeneous effects on male and female non-migrants.

South Africa presents a particularly interesting case for the study of internal migration in developing countries. In most countries, migration has been a slow and consistent force in the last decades (or even centuries), gradually strengthening with the improvement of transportation systems and the growth of migrant network effects. In South Africa, however, segregationist policies implemented from the early 1900s - but ramped up after 1948 - severely limited the movement of the majority black population. While the Apartheid regime officially ended in 1991 (with the first democratic national election in 1994), the most important migration restrictions were withdrawn in 1986. This constituted a large shock to the system, resulting in a spike in the rate of internal migration. The post-Apartheid period in South Africa therefore provides a unique opportunity to study how a large portion of the process of internal migration plays out, and the impacts that this has on the non-migrant population, in a developing country context.

For over 80 years the mobility of South Africa’s black population was strictly controlled and the majority were forced to live in native reserves called ‘homelands’. This reflected the needs of the white-controlled government for cheap (predominantly male) migrant labour to support mining and industrial development but also political anxiety about permanent rural-to-urban migration of this disenfranchised population (Turok 2012). After the Second World War, political considerations dominated and increasingly draconian controls were imposed to limit black urbanisation in order to sustain political domination. Since the removal of restrictions, urbanisation has increased dramatically, and policy-makers have expressed concerns that many cities have been unable to cope with the influx of migrants. Despite its importance, there have been few studies of the dynamics of internal migration in South Africa, and none that have tried to measure the economic impacts thereof.

I examine the changing nature of female migration and impacts thereof on employment, hourly income and hours worked in 220 receiving districts in South Africa after Apartheid. Internal migration in South Africa has a strong gender dimension. Historically, the Apartheid-era migrant labour system meant that predominantly black African men moved to urban areas without their
families. After the abolition of influx controls, many women relocated to join their male partners (Von Fintel & Moses 2017). Migration feminisation took place at the same time as labour market feminisation. I first document the patterns of internal migration during and after migration controls. I uncover a number of interesting patterns - for example, that there was a huge surge in female migration after the end of migration restrictions. I then look at the impacts of migration on the non-migrant population in receiving districts between 1996 to 2001, a period during which there was considerable variation in district-level migration inflows. I use an empirical specification that includes district and time fixed effects and examine heterogeneous effects across gender and skill groups.

To identify the casual impact of migration flows, I exploit historical migration pathways - particularly between areas that were native reserves and receiving areas - to predict contemporary migration. I employ a shift-share ‘past settlement instrument’ that makes use of the tendency for female migrants tend to settle in places where earlier male migrants from the same sending region already reside. Crucially, given South Africa’s peculiar history, there is a strong case to be made that the historical distribution of (black male) migrants across geographical areas is unrelated to contemporary economic conditions in the same areas - and therefore that the exclusion restriction for the instrument holds.

I argue that the exclusion restriction for my instrument is likely to hold for three reasons. Firstly, the strict Apartheid era pass laws dramatically reduced the range of places to which the black population could migrate from homelands. For the most part, migrants could only move to areas where the government decided their labour was required, and these decisions were often based on political rather than strictly economic rationales. I exploit the exogeneity of the Apartheid era migration restrictions and allocation processes that produced variation across municipalities. Secondly, the end of Apartheid resulted in a substantial structural and spatial transformation of the economy. Apartheid era industries - often set up near homelands were dismantled - and the opening up of the economy to trade resulted in substantial regional economic divergence. Thirdly, my instrument makes use of the fact that the factors determining female migration in South Africa are very different to those determining male migration, especially in the period immediately after Apartheid. Consistent with these arguments, I find that Apartheid era male migration strongly predicts post-Apartheid female migration (suggesting women followed their male partners) but does not predict male migration in the latter period well.

My preliminary results suggest that female internal migration has an overall large positive effect on hourly income for both men and women (with stronger effects for women) and a negative effect on male non-migrant employment and hours worked. I also find that female migration increases employment for highly educated women relative to other female education groups and reduces employment for low-educated men relative to other male education groups. I provide a preliminary analysis of possible channels for these effects, which I will expand on in later versions of this paper.

My paper contributes to the literature on internal migration in developing countries. South Africa
is one of the very settings where an instrument using historical migration pathways can plausibly capture exogenous variation in migration flows. Furthermore, I focus on female migration, which is an under-explored area in migration research. My paper also contributes to some recent literature that has tried to exploit the quasi-experimental setting resulting from Apartheid to study the development of the country. As I argue in my paper, one major shortcoming of some of these papers is that they have assumed that Apartheid era restrictions ended in 1994 when in fact most of these ended much earlier. For the construction of my historical instrument, I use one of the censuses from the period before 1991, which, to my knowledge, has not been done before in post-Apartheid economic studies.

2 Related literature

My paper adds to the burgeoning literature on internal migration and its economic consequences in developing countries. This literature is much smaller than the substantial literature on international migration, despite the fact that there are at least four times as many international migrants as internal migrants (UNDP 2009). Much of the earlier work in economics on the dynamics of the internal migration process in developing countries was theoretical. The Harris-Todaro model (1970), which claimed to show that rural-urban migration exacerbated urban unemployment, has influenced policy for decades in developing countries. Such theories formed the basis for programmes to limit internal migration in China (with its ‘Hukuo’ system), Thailand, India and Peru, amongst other countries (Lall et al. 2006). More recent theoretical work has suggested that migration may have beneficial effects both in receiving and sending regions, but the validity of the various competing models has not been clearly established (ibid.).

The empirical literature shows mixed results for the impacts of migration on labour markets in developing countries.1 A static model of a competitive labour market, assuming labour supply is inelastic, suggests that an influx of migrants should have a negative effect on the employment and income of non-migrants. However, recent research has shown that migrants represent more than a simple increase in labour supply - and that there may be complementarities with non-migrant workers as well as substitution in the production function (Lewis & Peri 2015). It has also been demonstrated that the simple increase in population resulting from migration flows may be beneficial to productivity through agglomeration economies (Combes et al. 2015). Lastly, recent papers have begun exploring the possibility that in-migration shifts the demand curve for labour to the right since more people in a region means more demand for non-tradeable goods and services and therefore more labour (e.g. Bae & Kochin 2018). Some developing country studies have found negative effects of migration on income and employment (e.g. Kleemans & Magruder 2017, Maystadt et al. 2014), while others have found strong positive effects (e.g. Combes et al. 2015).

Following on from work on the impacts of international migration in developed countries, several

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1Note that most of these studies have focused on international migration rather than internal migration.
recent studies have looked at the economic impacts of internal migration in developing countries using spatial variation of migrant inflows for identification. A well-known challenge is overcoming the endogeneity of migration flows: the fact that migration is likely to be correlated with economic conditions in receiving regions, which will bias estimates of migration effects. A popular approach in developing country settings has been to rely on exogeneous variation in weather between regions to construct arguably plausible instruments for interregional migration flows (e.g. Strobl & Valfort 2013). Other predictors of migration flows have been the geographic distance between the sending and receiving region, the ratio of receiving to sending region per capita incomes and - in the approach adopted by this paper - the share of the migrants from the sending region already established in the receiving region.

Since Card (2001), past settlement instruments (otherwise known as ‘enclave-’ or ‘network instruments’) using the lagged geographic distribution of migrants have been employed extensively in the immigration literature, and also in the internal migration literature, albeit to a lesser extent. A well-known difficulty with this type of instrument is that it can only address the endogeneity of migrant location choices if local economic shocks that attracted the earlier migrants are not also at work during the contemporary period (Borgas 1999). In recent years, this assumption has been increasingly questioned. Most papers do not even attempt to tell a story of why migration determinants should have changed, merely relying on significant time passing between the contemporary and lagged periods. In situations where migration pathways are highly stable over time (which is very often the case), historical migration pathway instruments may predict current migration flows well but it is highly unlikely that the exclusion restriction holds (Jaeger et al. 2018). In this paper, I make use of the fact that dramatic changes in South African government policy created a substantial shift in the area-of-origin composition of internal migrants in South African regions between the Apartheid and post-Apartheid periods.

My paper also adds to the growing literature that tries to exploit exogenous variation resulting from Apartheid to study the development of South Africa (Bakker et al. 2016, Biavaschi et al. 2018, Mariotti 2015). One shortcoming of most of these papers is that they have assumed that all Apartheid era policies ended abruptly in 1994 with the first democratic elections. A more careful appraisal of the historical record shows that the Apartheid regime was gradually dismantled from the mid-1980s to 1991. In the case of migration restrictions (which also applied for a time to black immigrants from other countries), the most important of these actually ended with the repeal of the Pass Laws Act in 1986 - and not with democratisation in 1994 - following which blacks were free to move to cities (Ogura 1996). My paper uses 1985 census data for the construction of the historical instrument, which precedes the repeal of migration restrictions.

My paper also adds to the literature on international and regional migration in South Africa. Since the 1990s, there has been a much greater focus on immigration, especially with a large influx of undocumented immigrants coming from failed states in the region. A few recent papers have tried to measure the effects of international migration on labour market outcomes in South Africa
Apart from making use of questionable instruments (see above), these papers suffer from several other data and methodological problems: they use census data on labour market outcomes of natives (which are not suitable for this purpose - cf. Ardington et al. 2006) and, in the case of Biavaschi et al. 2018, define the variable of interest in terms of the change in (im)migrant flows instead of the change in (im)migrant stocks.

There have also been some limited studies on internal migration in South Africa. Several studies (Oosthuizen & Naidoo 2004, Naidoo et al. 2008, Rogan et al. 2008) have focused on profiling internal migration to particular metropolitan areas (usually Cape Town or Gauteng) and trying to analyse push and pull factors contributing to migration. There has been no nationally representative studies of internal migration in South Africa, nor has there been any previous attempt to measure the economic impacts of internal migration in South Africa.

Lastly, my study contributes to the emerging literature on gender differences in local labour markets. Most studies just assume away gender. A couple of papers have examined the effects of female immigration from low income countries on the labour of high skilled women in Italy (Barone & Mocetti 2011) and the US (Cortes & Tessada 2011). To my knowledge, only one previous (unpublished) work has looked at the effects of female internal migration: Friere (2011) examines how increasing female migration in Brazil affects the gender wage gap.

### 3 Historical background

The philosophy underlying separate development in South Africa can be traced back to the early days of its colonial history. Segregationist policies began in 1913, three years after the formation of the Union of South Africa, when the Native Land Act was passed. This was designed to counter the flow of blacks to urban areas after the devastation caused by the Second Anglo-Boer War (1899-1902) and demarcated black reserves reserved for black ownership and occupation while prohibiting the black population from owning land outside of them (Ogura 1996). Further legislation in 1923 and 1937 compelled the black population to live in certain areas and prohibited the black population, born outside of cities, from spending more than 14 days (and, later, three days) in cities to seek work.\(^2\) Despite these restrictions, the black population in cities grew, especially with the increased demand for labour from the rapidly developing manufacturing industry around the time of the Second World War (Christopher 2001).

Restrictions on migration became much stricter after 1948 when the Afrikaner National Party (NP) came to power and implemented its programme of Grand Apartheid (‘apart-ness’ in Afrikaans), which aimed at compete social and spatial segregation and was supported significant government resources. Grand Apartheid aimed at moving the majority of the black population - all who were

\(^2\)The relevant laws were the Native (Urban Areas) Act (1923), the Native Laws Amendment Act 1937 and the Native (Urban Areas) Consolidation Act (1945).
not needed as labourers in white urban areas - to native reserves. To this effect, it has been estimated that 3.5 million black people (equivalent to a fifth of the black population in 1980) were forcibly relocated from ‘white’ areas. A number of important laws were passed. The Group Areas Act of 1950 established racially separated residential areas (which would later become ‘townships’) in metropolitan areas and smaller cities and was meant to strengthen controls on the flows of blacks into cities (Ogura 1996). The Population Registration Act (1950) assigned a population group to each citizen, which determined their political and social rights. The Pass Laws Act (1952) forced every black African to carry a passbook (similar to a passport) at all times documenting their permission to be in certain areas for more than 72 hours, without which they were subject to arrest (Wilson 2001). In 1959, the Promotion of Bantu Self-Government Act formalised the system of homelands, one for each ‘ethnic’ group. These homelands were overcrowded with extremely high rates of poverty and unemployment (Christopher 2001).³

Importantly for this paper, black migrants from homelands during Apartheid were not free to choose where to migrate to on the basis of economic incentives (Feinstein 2005, Mariotti 2015). To a large extent, they could only move to areas where the government decided their labour was needed, and these decisions were usually made on political rather than economic grounds. For example, it was South African government policy that each reserve would send the majority of its workers to one specific industry (Leys 1975, Mariotti 2015).⁴ For example, the Chamber of Mines in South Africa recruited from four out of ten homelands, and predominantly from just one (Mariotti 2015). Many migrants were also recruited to work in the ‘border industries’ - principally light manufacturing - that were developed with government incentives made available after 1955 in regions near homelands.

Mobility restrictions in South Africa were very strict, and hundreds of thousands of arrests were made every year under the pass laws. Black workers - including those in homelands as well as those working in cities - were unable to respond to labour market shocks in the rest of the country - such

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³By the time they were reincorporated in 1994, South Africa’s homelands - their land mass constituting 13% of the total South African land mass - were home to approximately 20 million black South Africans.

⁴Note that the jobs on offer would have been low-skilled in nature and so it is highly unlikely a particular homeland would have been chosen to supply labour to an industry based on a preexisting skillset that was more abundant amongst this population. The choice of industry each homeland contributed to was independent of the stature or strength of the inhabitants (Mariotti 2015).
as a doubling of the demand for black South African labour on mines in the 1970s (cf. Mariotti 2015) - and could only relocate to such areas if they were invited there by the authorities. While it was not the case then that workers were forced to migrate to particular areas in South Africa, their choice set was severely limited: they either had to accept an offer to work in a particular industry in a particular place or they could remain in homelands and try to get by on subsistence farming or remittances from family members. Those who decided to take up job offers would often have to relocate to areas, which were often more than a day’s travel from their homeland of origin, and they might only have been able to visit their families on one or two occasions a year (Ogura 1996). The result was the formation of migrant enclaves across the country.

Also important for this paper were the conditions around female black migration in the pre-1994 period. There were few employment opportunities for black women in cities and towns (sometimes they could find work in factories or as domestic workers). The Pass Laws prevented the spouses or children of pass book holders from accompanying them to the urban areas they were employed in (von Fintel & Moses 2017, Healey-Clancy 2017). Black migrant men lived in single sex compounds near the work-sites and were not allowed to have visitors of the opposite sex. Following the end of migration restrictions, female migration from homelands dramatically increased (as I explore in the following section). Many women would have followed in the footsteps of their male partners who had been migrants while the migration restrictions were in place (von Fintel & Moses 2017).

In support of this thesis, in the 2001-2002 HSRC National Migration Survey the main reason cited by female respondents for having migrated between magisterial districts was ‘getting married or moving in with a partner’ or ‘getting separated or divorced’ (13% together of respondents) (Wentzel et al. 2006). ‘Moving closer to relatives’ was ranked as the third most important reason for moving by (8% of) female respondents, and ‘having to move with a spouse’ was another common reason cited by (7% of) female respondents (ibid.).

While the Apartheid regime officially ended in 1991, the most important migration restrictions were withdrawn in 1986 - with the Abolition of the Influx Control Act. With this act, the pass system was dropped and black people were allowed to purchase land and housing outside of the homelands. This resulted in a spike in the rate of internal migration. Simultaneously, from the early 1990s, tough international sanctions were loosened and then repealed, and the economy was opened up with dramatic consequences in terms of the spatial distribution of economic activity. While the South African economy experienced negative economic growth in the decade before 1994, in the following decade it experienced positive economic growth (Aron et al. 2009). Rapid regional economic divergence in the post-Apartheid period has also been documented. Bosker & Krugell

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5 Looking for work’ ranked second highest (11%) as the most important reason for moving for female migrants. For male migrants, on the other hand, this was by far the most important reason for moving (23%) (Wentzel et al. 2006 pg.189).

6 In general migration networks seem to be an important determinant of internal migration in South Africa. In an econometric analysis based on the HSRC National Migration Study, it was found that the presence of a migrant network in a possible destination area was by far the most important predictor of whether a respondent chose to migrate in the five years before the survey (Wentzel et al. 2006 pg.195).
(2008) find evidence that poorer regions have been getting poorer and richer regions richer, with high income areas acting as growth poles and absorbing economic activity from their surroundings. Relatedly, Imbs (2013) studies rapid structural transformation in the post-Apartheid period in South Africa, finding that as South Africa opened to international trade, manufacturing sectors delocalised, extractive industries waned and services took over, substantially altering the spatial economic landscape of the country.

4 Data
4.1 Unit of geography

The main geographic unit of observation in this paper is the magisterial district. There are 354 magisterial districts in South Africa with an average territory of 3447.5 km². In 1996, these had an average population size of approximately 100,000. Magisterial districts are administrative units but closely approximate labour markets and have been used as such in several recent papers (e.g. Magruder 2004). Each magisterial district corresponds to the jurisdiction of a magistrate’s court, the lowest level of the South African court system, and contains at least one sizeable town or city. While regional boundaries in South Africa are known to change quite regularly in recent times, they were remarkably stable during and in the decade after Apartheid.

Since I am focusing on migration from areas classified as homelands during Apartheid (within which black people could move freely) to the rest of South Africa (where black people could not move freely when the pass laws were in place), I exclude magisterial districts from my sample of receiving districts that overlapped with homeland areas in the Apartheid period. This leaves a sample of 220 receiving districts. In the case of most homelands, there was a clear continuation between former homeland boundaries and current magisterial districts. In the case of a few homelands (Kwazulu in particular), some work is required to determine which magisterial districts should be considered as part of former homeland areas. For now, I have used EOG DMSP nighttime light data from 1991 and 2010 to identify population clusters and to determine whether roughly at least 30% of the population of a magisterial district in 1991 was settled on an area within a former homeland area - in which case, I consider this as a ‘homeland magisterial district’.

7While magisterial districts still exist, there were replaced by local municipalities as an administrative layer in the census and most surveys after 2001.
8The number of magisterial districts is higher in 1996 than in 1985 but this was mostly just due to some cases where adjacent magisterial districts were combined. Moreover, four homelands were considered independent in 1985 and only after 1994 were new magisterial districts boundaries drawn for these areas.
9For the few magisterial districts that only partially overlap with former homelands, I may also consider weighting migrants by the probability that they came from the homeland area based, for example, on the relative share of a magisterial district’s land area that overlaps with a former homeland.
4.2 Migration & regional controls

Contemporary migration data come from the 10% sample of the 1996 and 2001 censuses, which cover 3.6 million and 3.7 million individuals respectively. These censuses contain questions on the duration of time at current residence and the place of previous residence. Focusing only on migration from former homelands, I calculate migrant stocks in receiving districts in 1996 and 2001. The large size of the samples means that I can create an accurate measure of internal migration at a relatively fine spatial scale. For the construction of the historical pathways instrument, I use data from the full-count 1985 census, which provides information on the place of birth of individuals.\textsuperscript{10}

4.3 Labour market outcomes & individual characteristics

For the main analysis, I use South African labour force surveys (available annually, biannually or quarterly, depending on the period) from 1996 to 2017 and including on average approximately 25,000 households per wave. These contain much more detailed information than the census on labour force characteristics (including exact labour income earned, hours worked and more detailed occupation and industry information). While most of these surveys do not provide data on migration, several waves spread throughout the series do include this information, which allows me to differentiate between migrants and non-migrants in certain periods. I pool data from LFS 1996 and LFS 1997\textsuperscript{11} to merge with migration data from the 1996 Census and I pool data from LFS

\textsuperscript{10}In fact, information is only provided on whether people were born in a homeland (with the particular homeland listed) or whether they were born in (the rest of) South Africa. However, this is sufficient information for my identification strategy.

\textsuperscript{11}Actually these survey were part of the October Household Survey series but they function as a labour force surveys since they contain detailed information on labour force characteristics, which is directly comparable to that
September 2003 and LFS September 2004 to merge with the 2001 Census data. For my analysis, I include individuals in the civilian labour force between the ages of 18 and 64. In terms of relevant controls, educational attainment is defined for the following five categories: No education, primary education, incomplete secondary education, complete secondary education and tertiary education. I also include controls for age, age squared, marital status, race and trade union membership.

Create an employment variable that stands for the employment status of the respondent. The employment variable is binary and takes the value of 1 if the respondent reports to be employed and 0 if she reports to be non-employed and actually searching for a job or inactive. Note that unemployment is typically defined in terms of being non-employed and actually searching for a job (in the formal sector). Yet the ILO has recognised that the job search criteria may not be meaningful in developing countries where labour markets are dominated by the informal sector.

Unsuitability of the standard definition of unemployment. Verify in robustness checks session that results do hold if use the alternative definition of unemployment (Strobl & Valfort 2013).

For my summary statistics, I have used South African census data, which contain information on labour market outcomes and individual characteristics. In terms of labour market outcomes, I have information on employment outcomes, type of employment and total income.

4.4 Summary statistics & discussion

Table 1 shows some summary statistics\textsuperscript{12} for migrants and non-migrants for 1985, 1996 and 2001. For 1996 and 2001, migrants are defined as people in the civilian labour force and between the ages of 15 and 64 who moved from homelands - or former homelands - to the rest of South Africa in the five years prior to the census. Non-migrants are defined as people in the civilian labour force and between the ages of 15 and 64 in migrant-receiving districts who did not move in the five years prior to the census. I have also included information from 1985 for comparative purposes, however here ‘migrant’ is defined as a person between the ages of 15 and 64 who was born in a former homeland area but is now living in a non-homeland area and ‘non-migrant’ is defined as a person between the ages of 15 and 64 who was born in a non-homeland area.\textsuperscript{1314}

The average age of the migrant population was 4-6 years lower than that of the non-migrant population in 1996 and 2001 with the gap seeming to widen over time. During Apartheid, migrants had much lower levels of education than non-migrants. However, by 1996, migrants had dramatically closed this gap.

\textsuperscript{12}I will expand this table in later versions of this paper.

\textsuperscript{13}Unfortunately the 1985 census data file only provides detailed information on place of birth of South Africans for those born in homelands. Besides for this, I only have information on whether a person was born in South Africa or not. This is sufficient information for constructing my instrument even if it is not ideal for this descriptive analysis.

\textsuperscript{14}Since it is difficult to identify people who are unemployed in the 1985 census (I am still waiting for clarification of some ambiguous value labels in the dataset from the Statistics South Africa), for the moment the 1985 sample population used here also includes people not in the labour force.
In 1996, for both men and women, the difference in average years of education between migrants and non-migrants was less than one year, even if the proportion of migrants that had completed at least high school (Grade 12) was still 5-6% lower than that for non-migrants. A standout finding is that by 2001 migrants had a higher level of educational attainment than non-migrants. Remarkably, the proportion of female migrants that had completed at least Grade 12 more than doubled between 1996 and 2001 (with a similar increase for males). In 2001 migrants also had on average an extra 0.5 years of education than non-migrants. While the fact that migrants were more educated than non-migrants by 2001 may seem surprising at first, it is important to put this finding into context. The migrant population from homelands/former homelands was made up entirely of black people who were systematically provided with poor quality education during Apartheid. Education reform towards the end of Apartheid dramatically improved educational opportunities for black youth. Thus, the fact, as discussed above, that the migrant population is much younger than the non-migrant population goes a long way towards explaining how it could be that that migrating population in 2001 was more educated than the non-migrant population.

In 1985, before the end of migration controls, the female share of migrants was very low at 33%. By 1996, this share had gone up dramatically to 42% of the migrant population and by 2001 women made up 47% of the migrant population. Also interesting is that while the ratio of female to male employment increased marginally for non-migrants between 1996 and 2001, there was a much larger increase in this ratio (from a lower base) for migrants from former homelands over the same period.

I am particularly interested in the nature and implications of this surge in female migration from former homeland areas after the end of migration restrictions. A priori, female migration in South Africa is likely to have very different effects to male migration on labour market outcomes in receiving regions. Given the particularly high barriers to female migration during Apartheid (as discussed earlier), there might have been shortages of the kind of labour they offered in cities. It is possible then there may have been particularly high productivity effects associated with female migration. Though this remains a very understudied area of the South African economy, there is anecdotal evidence to suggest many of these women would have found employment as domestic workers in towns and cities in the post-Apartheid period. There is also some evidence that migrant women have found work in factories and in the informal economy. Previous literature on migration in South Africa does not seem to have picked up on the dramatic improvements in the level of education of (especially female) migrants after Apartheid. If skill level is defined by level of education, then it appears that by 2001, female migrants from rural South Africa were not as low-skilled as is generally the case in other developing countries. However, one also needs to consider that these female migrants would have had little or no work experience before they migrated.

15 In future work, I will look to develop a model to clarify these intuitions about the labour market effects of female migration in South Africa.
16 According to Dinkelman (2012), this sector employs one in five women in South Africa.
5  Empirical strategy

5.1  Baseline estimation

The analysis focuses on the effects of in-migration on employment, hourly income and hours worked of non-migrants in receiving areas, where non-migrants includes people in these areas who have been resident there for at least five years.

The effects of in-migration on individual labour market outcomes in destination districts are estimated using:

\[ y_{idt} = \alpha + \beta p_{dt} + \lambda X_{idt} + \gamma_t + \delta_d + \epsilon_{idt} \]  

(1)

Where \( y_{idt} \) is the outcome of interest for non-migrant \( i \) in district \( d \) at time \( t \). The natural logarithm of female migrant concentration is represented by \( p_{dt} \), that is:

\[ p_{dt} = \frac{M_{dt}^{fem}}{M_{dt}^{tot} + N_{dt}^{tot}} \]  

(2)

where \( M_{dt}^{fem} \) is the female migrant stock from former homeland areas at time \( t \), \( M_{dt}^{tot} \) is the total migrant stock (including both men and women from homeland and non-homeland areas) at time \( t \) and \( N_{dt}^{tot} \) is the non-migrant stock (including both men and women) at time \( t \). The vector \( X_{idt} \) includes individual controls for gender, education levels, age (and its square), marital status and trade union membership. I include district fixed effects and year fixed effects. \( \beta \) is the parameter of interest, which estimates the impact of the share of female migrants at time \( t - 1 \) on the outcome of interest at time \( t \). Errors are clustered at the district level to allow for correlation between individuals within district-level labour markets. For all estimations, I have used the recommended Statistics South Africa cross-entropy weights, which make all waves within the Post-Apartheid Labour Market 1994-2017 series directly comparable to one another by producing a consistent set of totals for each wave (Branson & Wittenberg 2011).\(^{18}\)

\(^{17}\)My fixed effects estimation with two periods is of course equivalent to a first-differences estimation i.e.

\[ \Delta y_{d} = \beta \Delta p_{d} + \lambda X_{d} + \epsilon_{d} \]  

(3)

with district weights equal to the number of observations in each district (multiplied by the cross-entropy weights described in the text). By focusing on the change in the female migrant stock over a five year-period, I am focusing on the effects of migrants who arrived (only) during this period. My ‘non-migrant population’ includes some people who would have migrated at some point in their lives but not in the past five years. Using district fixed effects avoids any bias resulting from the fact that levels of migrant shares and levels of labour market outcomes may be spatially correlated because of common fixed influences, which could lead to a positive or negative statistical correlation between migration and economic outcomes, even if there are no real effects of migration.

\(^{18}\)I have also run all my regressions without any weights and the results are substantially unchanged.
5.2 IV approach

The number of migrants a receiving district may receive may be correlated with the economic conditions of that district i.e. the number of internal migrants $m_{dt}$ could be correlated with $\epsilon$. OLS estimates may have an upward bias if female migrants choose to move to districts experiencing positive labour market shocks. However, if female migrants choose to stay away from cities with a high cost of living, OLS estimates may have a downward bias. Measurement error will also push OLS coefficients towards zero. I try to overcome these possible sources of bias by making use of a 2SLS approach.

My instrument uses the tendency of new female migrants to follow in the footsteps of earlier male migrants from the same sending region. As much research has shown, migrant networks are an important consideration in the location choices of prospective migrants since these networks assist with the job search process and assimilation into the new environment (Munshi 2003). The instrument uses the 1985 distribution of male migrants from a given reserve to allocate the new wave of female migrants from that same area in the post-Apartheid period. Formally, the instrument for the inflow of female migrants to district $d$ during time period $t$ can be written as:

$$\sum_j \frac{M_{rd1985}^{male}}{M_{r1985}^{male}} \times M_{rt}^{fem}$$

where $r$ are areas that were classified as reserves under Apartheid as in the 1985 census; $\frac{M_{rd1985}^{male}}{M_{r1985}^{male}}$ represents the proportion of all male migrants from area $r$ included in the 1985 census who were settled in receiving district $d$; and $M_{rt}^{fem}$ represents the total number of female migrants from an area previously classified as a reserve $r$ at time $t$ in the contemporary period. The instrument is therefore a weighted average of the female migration rates from former homeland areas (the ‘shift’) with weights that depend on the distribution of earlier male migrants in 1985 (the ‘shares’).

My identifying assumption is that where male migrants ended up before 1985 in South Africa is unrelated to the 1996-2001 changes in the outcomes of interest, namely, income growth, employment growth and change in the number of working hours. To reiterate (in brief) what I have argued in the introduction and historical backgrounds, this assumption is likely to hold for several reasons. During the Apartheid era, due to strict pass laws, South Africa’s black population based in homelands were severely limited in their choice set when it came to migration and were generally not able to respond to labour market shocks. They essentially could only move to areas where the government decided their labour was needed, and these decisions were usually made on political rather than economic grounds. For example, it was South African government policy that each reserve would send the majority of its workers to one specific industry (Leys 1975, Mariotti 2015). The exclusion restriction for the instrument is also more likely to be satisfied given that the end of Apartheid constituted a structural break in the economy of South Africa, and the distribution of economic activity changed
substantially between the Apartheid and post-Apartheid periods. So-called ‘border industries’ that were established around homelands were dismantled towards the end of Apartheid, and with the lifting of international sanctions, the performance of the economy dramatically improved in certain parts of the country. By instrumenting female migration with historical male migration, I also add another layer of exogeneity to my historical instrument since migration pull factors are likely to be substantially different for men and for women.\textsuperscript{19}

6 Preliminary results

To be completed.

7 Robustness checks

To be completed.

8 Discussion and channels

My preliminary results suggest that there were overall positive gains from female in-migration in South Africa after Apartheid. Both non-migrant men and women benefited through large increases in hourly income, which suggests substantial productivity effects of female migration (Combes et al. 2015). Furthermore, whereas in-migration is often imagined as causing a movement down a constant labour demand curve, it is also likely that the influx of women into cities and towns resulted in an increase in demand for non-tradeable goods and services, thereby shifting the demand curve for labour to the right.

However, it was not the case that all subsections of the non-migrant population benefited from this female in-migration and I have shown evidence that men, particularly those with a low level of education, experienced reduced employment and hours worked. This suggests that female migrants (who were relatively well-educated though lacking in experience) may have substituted for low-skilled non-migrant men in production. On the other hand, highly-educated women’s employment went up as a result of female in-migration. One likely cause of this was the fact that many female

\textsuperscript{19}For that part of my analysis that focuses only on the effects on female non-migrants, the dynamics of female internal migration in South Africa (as discussed earlier) also reduce potential concerns related to the validity of my migration instrument in the presence of possible outmigration from receiving districts (Goldsmith-Pinkham et al. 2018). The instrument requires that there are no spillovers, or at least no complete spillovers. Due to the fact that there is very little female migration for labour market reasons in South Africa, I can assume that receiving magisterial districts are to a large extent closed economies for female non-migrants. Of course there may still be some concerns about male non-migrants moving out of districts in response to female in-migration but since there is likely to be less direct competition for jobs between migrant women and non-migrant men, these spillovers are likely to be smaller in magnitude than if I were focusing on male migration and the effects thereof.
migrants would have become domestic workers, particularly in well-educated, wealthier households, thereby freeing women from household labour and allowing them to pursue employment. In future versions of this paper, I will explore these potential channels in more depth.
References


